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## LHC Software and Computing - Enabling the LHC Physics Program

# physikalisches

Mo. 23.11.15  
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The Large Hadron Collider (LHC) was approved in the nineties to become the future multi-TeV machine to explore the high energy and precision frontiers in particle physics. From the very beginning it was clear that the LHC was posing unprecedented challenges, amongst many, to the computing and the software development in order to deal with the expected trigger rates and data volumes. The idea of the LHC Computing Grid, a federation of computing centres across the globe, took shape to provide the computing infrastructure for the experiments. The creation of the offline software infrastructure equally took more than a decade, starting from the Fortran based frameworks used in the early years, up to the modern codes in use today.

In the presentation an overview will be given of 15 years of developments in LHC software and computing and how this enabled the rich physics program that included the discovery of the Higgs Boson. The lessons learned from the first LHC running period between 2010 to 2012 will be discussed. Over the last 2 years the LHC experiments have implemented significant upgrades to their computing and software infrastructure in view of the challenges for the even higher energy, luminosities and trigger rates during the running period that started this year. In the final part of the seminar an outlook will be given, covering the implications of the future HL-LHC upgrades, as well as the evolution of computing technologies and the necessary changes to programming techniques and distributed computing those will bring.

